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ENDANGERED SPECIES

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Endangered Species Program, Washington, D.C. 20240

Arizona Agave Proposed as Endangered

The Arizona agave (*Agave arizonica*), a succulent known only from a small area in central Arizona, has been proposed by the Service for listing as an Endangered species (F.R. 5/20/83). This plant is jeopardized by collection for cultivation and trade and by habitat disturbance due to cattle grazing.

Agave arizonica was discovered by J. H. Houzenga, H. J. Hazlett, and J. H. Weber in the New River Mountains of Arizona. Weber and H.S. Gentry described it as a species in 1970 (*Cactus and Succulent Society Journal* 42(5): 223-225). This member of the Agave family has basally attached leaves in a somewhat flattened globular rosette which measures about 30.7 centimeters high and 41 centimeters broad. Its slender, branching inflorescence (flowering stalk) is 2.7-3.6 meters tall. The flowers are small, pale yellow, and jar-shaped. These characteristics make the Arizona agave an attractive plant, and one highly desired by collectors for desert rock gardens. Unfortunately, *Agave arizonica* is a slowly reproducing plant which could not readily repopulate an area from which individuals are removed. The Arizona agave is endemic to a very small area in the granite hills and creek bottoms near the summit of the New River Mountains within the Tonto National Forest. Its historically known population occurred within an area of about a 3.3 to 5.0 kilometer radius. In 1980, about 25 plants were known at 12 to 14 localities, but today only 3 plants are known to remain at only one site. The land use on this area consists of leased cattle grazing.

There is a great potential for taking of this attractive species for cultivation and trade. In recognition of this threat, the southwest botanist of the U.S. Forest Service has suggested that the agency prohibit the taking of all agaves in the west central portion of the Tonto Mountains within the species' range. However, such prohibitions are difficult to enforce in the extremely rugged backcountry, especially with the limited number of personnel available for patrol.

Cattle grazing may have an effect on the agave by trampling, habitat disturbance, and some minor grazing of the plants. In addition, deer browse this species and may play a role in its poor reproductive success by eating the flower stalks before the capsules ripen. If the agave is listed, studies will be undertaken to determine specific grazing impacts and any compatible levels of grazing use.

Although the Arizona agave is protected by the Arizona Native Plant Law, this bars only collection, not incidental destruction or habitat modification. It does not affect Federal actions directly. Violations only constitute a class three misdemeanor, the lowest grade recognized under State law. Moreover, the law is difficult to enforce over the entire State of Arizona, especially in the rugged, mountainous regions. Listing the plant in accordance with the Endangered Species Act would complement the existing measures and offer additional protection from Federal activities, taking on Federal lands, and trade, as well as increase the penalties for violations.

Agave arizonica was first proposed for listing in June 1976, along with about 1,700 other plants identified in a petition prepared by the Smithsonian Institution. In accordance with the listing schedule deadlines imposed by the 1978 Endangered Species Act Amendments, the proposal was withdrawn in 1979. On December 15, 1980, the Service published a new notice of review for plants which included *Agave arizonica* as a candidate for listing.

Effects of a Final Rule

If the proposal is approved as published, the Arizona agave will be listed under the Act as an Endangered species. Section 7 of the Act requires all Federal agencies to ensure that any activities they authorize, fund, or carry out are not likely to jeopardize the species' continued existence. Since all populations of the Arizona agave occur on U.S. Forest Service lands, that agency will have the primary Section 7 responsibility, and it has given its support to the listing proposal.

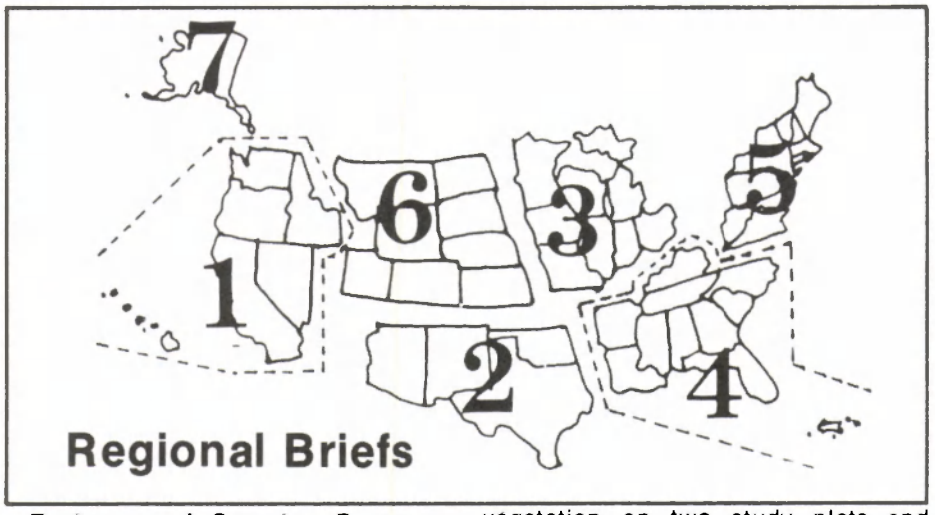
With regard to trade of *Agave arizonica,* all of the prohibitions contained in 50 CFR 17.61 on interstate and international trafficking would apply. Further, the 1982 Endangered Species Act Amendments make it unlawful to remove and reduce to possession Endangered plant species from areas under Federal jurisdiction or to sell it, offer it for sale, or deliver, receive, carry, transport, or ship it in the course of a commercial activity. Special permits for certain otherwise prohibited activities could be requested under 50 CFR 17.62 and 17.63 from the Federal Wildlife Permit Office. Critical Habitat for the Arizona agave is not being proposed since publication of the precise location in the *Federal Register,* as required by such a designation, would make the species more vulnerable to collection. It should be emphasized, however, that even without a formal Critical Habitat determination, the Arizona agave will receive the full habitat protection authorized under Section 7 of the Act.

Public Comment Requested

Comments on the proposal are requested from all interested agencies, organizations, and individuals, and should be received at the Office of Endangered Species, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103 by July 19, 1983. Requests for a public hearing on the proposal must be received by July 5, 1983.

Courtesy of the Desert Botanical Garden, Phoenix, Arizona.

This attractive plant, the Arizona agave, is threatened by collection for cultivation and trade.



Regional Briefs

Endangered Species Program regional staffers have reported the following activities for the month of May:

Region 1—The vegetation management program on the Morro Bay Ecological Preserve to restore habitat of the Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*) was completed this April (see April 1983 BULLETIN). The project included thinning scrub vegetation on two study plots and removal of exotic iceplant from the preserve. The targeted plants were removed by hand by members of the California Conservation Corps and all removed plant material was disposed of off site.

Field observations of southern sea otter (*Enhydra lutris nereis*) response to underwater acoustical tests and air gun blasts were completed this past month. Preliminary analysis of the data indicates that the tests have not had significant adverse effects on sea otter behavior. These behavioral studies were undertaken to ensure that gray whale (*Eschrichtius robustus*) behavioral studies now underway were not adversely affecting the sea otter.

The Sierra snow pack is in excess of 200 percent of normal, allowing for unusually high Truckee River stream flow to enter Pyramid Lake throughout the rest of the year. Cui-ui (*Chasmistes cujus*) are responding to these conditions by congregating at the river end of Pyramid Lake in substantial numbers. Through gill netting, we are finding that this year's prespawning aggregate is comparable in density to that of last spring, when a record 14,000 ran the Pyramid Lake Fishway. We anticipate a similar size run this year. We assume, however, that cool spring temperatures have delayed the timing of the run. Last spring, the first cui-ui entered the fishway system in mid-April, while none had entered the system this spring as of May 27.

Region 2—About 45,000 bonytail chub (*Gila elegans*) fry were stocked in the backwaters of Lake Mohave (Arizona) in an effort to maintain the only known wild population of this Endangered species. Past studies indicate that the population in Lake Mojave is made up of individuals at least 40 years old, well past their expected breeding years. If the reintroduction is successful, it will provide genetic stock for future reintroductions into more suitable habitat.

Wolf pups are popping up all over. Thirteen Mexican wolf (*Canis lupus baileyi*) pups have been produced at the Wild Canid Survival and Research Center (St. Louis), the Rio Grande Zoo (Albuquerque), and the Arizona-Sonora Desert Museum (Tucson). These litters more than double the number of Mexican wolves in captivity, and provide a better chance for survival of the subspecies because seven of the young are females.

The Service met recently with the State of Texas, The Nature Conservancy, and private landowners to discuss habitat protection for the Navasota ladies'-tresses (*Spiranthes parksii*). Proposed road construction near College Station, Texas, would jeopardize several individuals of this rare orchid, which is believed to number no more than 150 plants. Rapid protection of a privately owned tract of 640 acres, which is adjacent to a proposed highway and which contains the majority of the plants, is essential if the species is to survive.

Under contract to the Service, the New Mexico Department of Fish and Game is preparing a recovery plan for the New Mexican ridge-nosed rattlesnake (*Crotalus willardi obscurus*).

Region 5—Peregrine falcons (*Faico*

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U.S. Fish and Wildlife Service
Washington, D.C. 20240

Robert A Jantzen, *Director*
(202-343-4717)
Ronald E. Lambertson
Associate Director and
Endangered Species Program Manager
(202-343-4646)
John L. Spinks, *Chief,*
Office of Endangered Species
(703-235-2771)
Richard Robinson, Acting Chief
Federal Wildlife Permit Office
(703-235-1937)
Clark R. Bavin, *Chief,*
Division of Law Enforcement
(202-343-9242)
TECHNICAL BULLETIN STAFF
Clare Senecal Kearney, *Editor*
Michael Bender, *Assistant Editor*
(703-235-2407)

Regional Offices

Region 1, Suite 1692, Lloyd 500 Bldg., 500 N.E. Multnomah St., Portland, OR 97232 (503-231-6118): Richard J. Myshak, *Regional Director;* William F. Shake, *Assistant Regional Director,* Sanford R. Wilbur, *Endangered Species Specialist.*

Region 2, P.O. Box 1306, Albuquerque, NM 87103 (506-766-2321); Michael J. Spear, *Regional Director;* Conrad A. Fjetland, *Assistant Regional Director;* James Johnson, *Endangered Species Specialist.*

Region 3, Federal Bldg., Fort Snelling, Twin Cities, MN 55111 (612-725-3500): Harvey Nelson, *Regional Director;* John S. Popowski, *Assistant Regional Director;* James M. Engel, *Endangered Species Specialist.*

Region 4, Richard B. Russell Federal Bldg., 75 Spring St., S.W., Atlanta, GA 30303 (404-221-3583): James W. Pulliam, *Regional Director;* John I. Christian, *Assistant Regional Director;* Alex B. Montgomery, *Endangered Species Specialist.*

Region 5, Suite 700, One Gateway Center, Newton Corner, MA 02158 (617-965-5100): Howard Larsen, *Regional Director;* Stephen W. Parry, *Assistant Regional Director;* Paul Nickerson, *Endangered Species Specialist.*

Region 6, P.O. Box 25486, Denver Federal Center, Denver, CO 80225 (303-234-2209): Galen Buterbaugh, *Regional Director;* John D. Green, *Assistant Regional Director;* Don Rodgers, *Endangered Species Specialist.*

Region 7, 1101 E. Tudor Rd., Anchorage, AK 99503 (907-276-3800, ext. 495): Keith M. Schreiner, *Regional Director;* Jon Nelson, *Assistant Regional Director;* Dennis Money, *Endangered Species Specialist.*

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Rulemaking Actions Continued—May 1983

Transshipment Amendment Proposed for Sea Turtles

The Service has proposed to amend the Special Rules for sea turtles under the Endangered Species Act to allow transshipment of certain green sea turtle (*Chelonia mydas*) products through the port of Miami (F.R. 5/4/83). The special rules currently prohibit import and export of commercial shipments of green sea turtle products, regardless of final destination.

Green sea turtles are protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). An exception under CITES, however, allows transshipment of listed specimens through a country that is a Party to CITES provided the specimens remain in Customs control. The Cayman Islands Government has requested that the Secretary of the Interior and the Secretary of Commerce amend the Endangered Species Act Special Rules to allow shipments of green sea turtle products to transit the United States, thereby providing harmony with the CITES exception. As proposed, these rules would grant that request under certain restrictions that would enable the Service to monitor traffic in such shipments. The comment period ended June 3, 1983.

Hearing Scheduled On Cave Shrimp Proposal

A public hearing will be held and the comment period reopened on a proposal of Endangered status and Critical Habitat for the Kentucky cave shrimp (*Palaemonias ganteri*). The Service has arranged these events to allow comment from government officials and the public (F.R. 6/7/83).

The hearing will be held at 7:00 p.m. on June 28, 1983, in the Community Building, which is in the vicinity of the Visitor's Center, at Mammoth Cave National Park, Edmonson County, Kentucky. The reopened comment period will close on July 7, 1983. Comments should be addressed to the Regional Director, U.S. Fish and Wildlife Serivce, The Richard B. Russell Federal Building, 75 Spring Street, S.W., Atlanta, Georgia 30303.

The proposal to list the Kentucky cave shrimp as Endangered with Critical Habitat was published in the *Federal Register* on October 17, 1980. A public meeting on that proposal was held in Bowling Green, Kentucky, on December 10, 1980. Since that time, the National Park Service has been carrying out studies of the distribution, status, and life history of the species.

Utah Prairie Dog Proposed for Reclassification

The Utah prairie dog (*Cynomys parvidens*) has been proposed by the Service for reclassification from Endangered to Threatened (F.R. 5/13/83). Although this rodent still only occupies a small part of its historical range, its overall numbers have increased since 1972. Two populations are now straining the carrying capacity of the available habitat, making them vulnerable to disease; in addition, conflicts with human agricultural interests are growing. To help prevent disease and illegal killings by area landowners, the proposal includes a special rule that would allow for the regulated take of up to 5,000 individuals annually under permit and in accordance with specific restrictions.

The species is a burrowing rodent in the squirrel (Sciuridae) family that occurs only in southern Utah. Its numbers have fallen from an estimated 95,000 individuals in the 1920s to a 1982 spring estimate of about 10,000 adults. The species has also experienced a corresponding loss of range. This population decline was caused by disease, habitat alteration, and poisoning because the prairie dog was considered a competitor with livestock for forage. In 1973, the Utah prairie dog was listed as an Endangered species. On November 5, 1979, the Utah Division of Wildlife Resources petitioned the Service to remove the prairie dog from the U.S. List of Endangered and Threatened species.

Today, the Utah prairie dog is no longer considered in danger of extinction, although the Service does not feel that the available data show it has recovered to the point where it can safely be removed from the list altogether. The population estimate of adult animals in the Cedar and Parowan Valleys in eastern Iron County increased significantly from 1976 (1,200) to spring 1982 (7,300). It should be noted that early spring censuses include only those adults that have survived the winter. In the summer, after the young are born and become active, but before the fall/winter mortality, the numbers are much higher. This is the time when it is necessary to reduce population pressures in the Cedar and Parowan Valleys; the summer numbers in these valleys are probably in excess of 20,000 prairie dogs.

Such large numbers of juveniles strain the carrying capacity of the habitat, and increase the danger of sylvatic plague. There also is a serious conflict in these valleys with agriculture. In the Cedar and Parowan Valleys alone, 98 percent of all prairie dogs are on private land upon which the major crop is alfalfa, a preferred prairie dog food. Crop losses have become extensive where large prairie dogs towns have developed, the mounds damage haying equipment, and the burrows drain irrigated fields. Since the species was given protection, its numbers have increased in some areas to the point that local farmers and ranchers might be tempted to return to such traditional, but now illegal, means as poisoning for relief. Uncontrolled measures like these could again reduce the species' population to an Endangered status.

In an effort to relieve the local overpopulation problems, the Utah Division of Wildlife Resources removed 2,437 animals from the Cedar and Parowan Valleys between 1976-1980 for relocating onto public lands. Although many of these animals apparently did not survive, the number of known prairie dog towns on private lands increased from 40 in 1976 to 57 in 1982; about 38 percent of all Utah prairie dog towns in 1982 throughout the species' total current range occur on public land. The State will continue to live-trap prairie dogs on private lands and relocate them to Federal lands, but it has become apparent that the relocation program is not able to keep up with the species' growing population in the Cedar and Parowan Valleys, and that new sites for reintroduction are limited. Accordingly, the proposed reclassification of the Utah prairie dog to Threatened contains a special rule that would permit the State to authorize certain individuals to legally take up to 5,000 animals annually between June 1 and December 31 in delineated portions of the Cedar and Parowan Valleys. Such taking would not be permitted by means of chemical toxicants.

The Service does not believe that the proposed control program would jeopardize the survival of the species in these valleys. Numbers of animals actually taken, their location, and the methods used would have to be reported to the Service at 90-day intervals. Further, the State will continue its annual Utah prairie dog census and will submit these data to the Service each year. The Service would reserve the right to imme-

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Recovery Plans Approved

Four Forest Birds of Hawai'i

The birds of Hawai'i, largest of the Hawaiian Islands, have suffered greatly from human activities and impacts on the fragile ecosystem. Ten of the bird species native to the island in historical times are now extinct; another eight are Endangered, and five other species survive in relatively healthy populations. A newly approved recovery plan addresses the status of four of the Endangered forest birds that have similar characteristics and habitat requirements: the Hawai'i creeper (*Loxops maculatus mana*), Hawai'i 'akepa (*Loxops coccineus coccineus*), 'akiapola'au (*Hemignathus wilsoni*), and 'o'u (*Psittirostra psittacea).*

Habitat degradation has played a major role in the decline of much of Hawai'i's native wildlife, including its forest birds. The forests of Hawai'i once were much more extensive than they are today. A drastic reduction resulted from overcutting for firewood, lumber, cropland, and pasture. Introductions of exotic livestock and game animals have been another significant factor. Grazing and browsing by feral ungulates have severely modified remnant forests at upper elevations on the Island of Hawai'i, and some of the wetter forests are subject to heavy rooting by feral pigs. Recently, a widespread die-back of 'ohi'a (*Metrosideros collina*), the most common native tree on Hawai'i, has further modified about 800 square kilometers of forest bird habitat. Increasing acreages also are being modified by the spread of exotic plant species, such as banana poka (*Passiflora mollissima*) and strawberry guava (*Psidium cattleianum*), whose seeds are distributed throughout the forests after feral pigs eat the fruits. Efforts to control these species have so far been unsuccessful. All of these factors have combined to dramatically change the physiognomy and species composition of the remaining native forests.

The endemic forest birds of Hawai'i appear very vulnerable to introduced diseases, particularly avian pox and avian malaria. Both diseases are known to be transmitted on Hawai'i by an introduced mosquito (*Culex quinquifasciatus*), a major disease vector. (Avian pox can also be spread directly by contact among birds, and by mites.) So far, there is a lower incidence of these diseases in forest bird populations above 1500 meters (4900 feet), an evaluation that also marks an area of declining viable *Culex* populations. An introduction of a *Culex* strain more adaptable to higher elevations, and/or the evolution of the existing species into a form that could move into the upper forests, could greatly jeopardize the remaining birds.

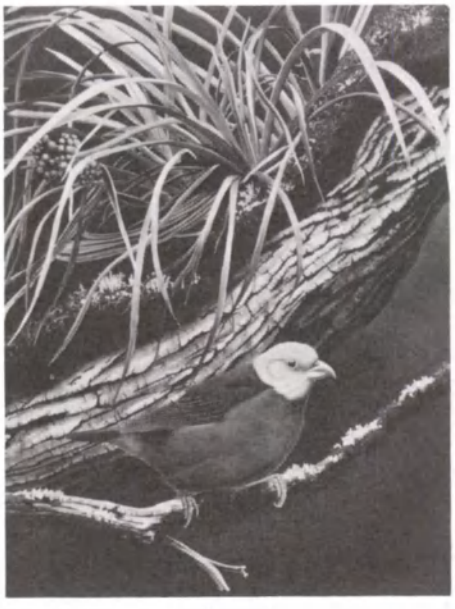
Before the arrival of Captain James Cook in 1778, native Hawaiians took some forest birds for feathers. The subsequent use of the shotgun in the late 1800's by museum collectors and native Hawaiians may have put intolerable pressure on local bird populations already reduced by other factors. In addition to humans, several other predators have become established on Hawai'i, including the domestic cat (*Felis cattus*), three species of rats (*Rattus* spp.), the mongoose (*Herpestes auropunctatus*), and the common myna (*Acridotheres tristis*). Exotic animals, especially birds, may be significant competitors with native forest birds for food, and the introduction of predacious and parasitic insects could have eliminated native insects upon which the Hawaiian birds fed.

Island species are particularly vulnerable because of their limited geographical distribution and frequently low numbers. Since the contemporary role of these threats has not yet been determined, it is uncertain whether populations of Hawai'i forest birds are continuing to decrease. But their historical decline is evident:

- Hawai'i creeper—This bird formerly was found in the 'ohi'a and 'ohi'a-koa forests throughout the island, usually above 1070 meters (3600 feet). Today, it occurs in upper elevation native forests on the windward coast, and very rarely on the leeward coast in only three locations. The Hawai'i creeper generally feeds on insects taken from the trunks and branches of mature trees.
- Hawai'i akepa—At one time, this subspecies was widespread around the island, and abundant in some areas. Its current distribution includes the upper slopes of Mauna Kea and Mauna Loa on the windward coast; the southeastern slopes of Mauna Loa; and the southwestern slopes of Hualalai. The Hawai'i 'akepa seems to prefer the closed canopy of 'ohi'a and koa (*Acacia koa*) where it is largely a foliage gleaner, feeding on small arthropods.
- 'akiapola'au—Formerly, this bird was found throughout the native forests from 400 meters (1300 feet) upward. It remains locally common in the higher elevation koa and 'ohi'a forests on Mauna Loa, and is found only rarely in Hawai'i Volcanoes National Park. The 'akiapola'au is a wood hewer which seeks out the larvae of cerambycid beetles and other insects beneath the bark.
- 'o'u—This bird is the rarest honeycreeper on the Island of Hawai'i. Historically, it was common in the wet forests of Kona, windward Hawai'i, and Kohala, but today it comprises a small population scattered along the windward coast of mid-elevation 'ohi'a forests. Although it has been seen to feed on insects, it apparently relies more heavily on the fruits and flowers of 'ie'ie (*Freycinetia arborea*). The fouling of 'ie'ie fruit by introduced rats has been cited as a possible reason for the species' decline on O'ahu.

Habitat conservation, especially at upper elevations, will be extremely important for the recovery of these species. With avian pox and malaria occurring with greater frequency in lower areas, the remaining habitat above 1500 meters (5000 feet) will provide the last refuge for the native forest birds if the mosquito belt moves higher. Accordingly, securing the upper forest habitat and/or favorably influencing land management practices has high priority in the recovery plan. This goal could be accomplished not only by establishing

'akiapola'au (*Hemignathus wilsoni*)



'o'u (*Psittirostra psittacea*)

reserves or negotiating easements, but by habitat restoration. Removing feral livestock from essential habitat and erecting protective fences is another objective. With the cooperation of private landowners, an "archipelago" of native forest areas could be created in forested pastures now being managed only for cattle. Planting koa in mixed stands, thereby encouraging forest diversity, and managing these lands on varying time schedules to maintain native ecosystems in conjunction with compatible land management activities, are advocated in the plan.

Control of exotic plants is another task identified for conserving habitat. Banana poka, for example, is now found over large areas, choking out native vegetation, attracting feral pigs with its fruit, and providing a defensible food source for aggressive nectivorous birds (thereby creating an imbalanced avifauna). The plan calls for developing an effective way to eliminate this pest plant from essential habitat, and encourages research into biological controls.

Control of the avian disease vector *Culex*, also important for the recovery of the native forest birds, could be achieved in part by reducing the number of mosquito breeding sites. Methods outlined in the plan for accomplishing this objective include: control of feral pigs, thus reducing their wallows; removing non-essential water tanks, troughs, and ponds; and the possible use of biological control of mosquito larvae in other waters. Screening incoming planes and ships could help minimize the possibility that other diseases or their vectors, as well as competitors or predators, could accidentally be introduced. Other means of controlling mosquitos will be investigated.

There is reason for optimism about the recovery of these Endangered forest birds, as well as the other native, nonlisted forest bird species. If the efforts of Federal, State, and local government agencies, as well as the private sector, can match these challenges described in the recovery plan, there is still time to conserve the remnants of the Hawai'i forest avifauna.

Copies of the Hawaiian Forest Birds Recovery Plan (approved February 3, 1983) and the Nene Recovery Plan (below: approved February 14, 1983) are available from the Fish and Wildlife Reference Service. Details on the plan and its implementation can be obtained from the Portland Regional Director (see page 2 for address).

Copies of these plans, and all approved recovery plans, will be made available for purchase from the Fish and Wildlife Reference Service, Unit j, 3840 York Street, Denver, Colorado 80205-3536 (800/525-3426). A 4-to-6 month printing time must be allowed following the date a recovery plan is approved by the Director, before copies may be available. A delay should be expected when ordering newly approved plans.

Hawai'i 'akepa (*Loxops coccineus coccineus*)
Illustrations by H. D. Pratt

Nene (Hawaiian Goose)

Photo by R.J. Shallenberger

Hawaiian geese

The nene (*Branta sandvicensis*), or Hawaiian goose, is the State bird of Hawai'i. It is similar in size to the Canada goose (*Branta canadensis*), from which it may have evolved, but it is highly specialized and is now restricted primarily to a habitat of rugged lava flows in upland scrub growth far from any free water. Among the more obvious physical adaptations is a reduction in the webbing between the toes. Another difference the nene (pronounced "nay-nay") shows is that it nests in the fall when day lengths are becoming shorter, unlike most other geese. Also, a nene does not normally migrate from the island on which it is reared.

Like many other endemic Hawaiian species, the nene has declined sharply since Captain James Cook's arrival in 1778. In a 1945 historical account, "The Hawaiian Goose, Its Distribution and Reduction in Numbers" (*Condor*, 47:27-37), Paul Baldwin showed that the nene's range on the Island of Hawai'i once comprised 2,475 square miles, extending from upper elevations all the way down to sea level in many places. He also estimated that the nene population prior to 1778 numbered about

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Nene

Continued from page 5

25,000. Due to various human-related factors, the wild population on Hawai'i had dwindled by 1952 to approximately 30 birds on a few remote upland pockets. Some movements of nene between Hawai'i and the Island of Maui are believed to have occurred, but any resident population on Maui became extinct before 1890. Fortunately, a relatively successful captive propagation and release program has given some reason for hope that the nene will survive in the wild.

Specifically, Baldwin listed probable causes for the decline as overhunting with firearms, increased taking of live birds and eggs, harassment of birds during nesting and foraging, and ranch development. Less direct, but still significant, human-related factors included introductions of predators (rats, feral pigs, feral dogs and cats, and the mongoose), competition from introduced birds, and the adverse effects of introduced plants on nene habitat. Further habitat damage resulted from grazing by domestic livestock, as well as from feral sheep, goats, and pigs.

More recent data indicate that the continuing decline in wild nene is due in part to low productivity. This problem may be linked to poor nutrition available in current nene habitat, particularly during the critical period when broods are being reared and adults are molting. A comparatively low percentage of adult nene in the wild actually breed each year (only about 50 percent), and gosling mortality is very high in the wild. Predation on eggs and incubating or brooding females also is significant.

Propagation and Release

With support from the Fish and Wildlife Service (FWS), the Hawai'i Division of Fish and Game (HDFG) has conducted a project over the past 30 years to propagate captive nene for restocking into suitable habitat and to conduct field studies on wild birds. Nene have been produced since 1949 at Pohakuloa, on the Island of Hawai'i, and reintroduction began in 1960 with the release of 20 young at the Keauhou Sanctuary. A total of 1,319 nene had been released by June 30, 1982, at four sanctuaries on Hawai'i. Three of the sanctuaries, Keauhou, Keauhou 2, and Kahuku, were established through cooperative agreements with landowners, and the fourth is on State lands (Kipuka 'Ainahou Nene Sanctuary).

At about the same time that the captive nene program began in Hawai'i, the Severn Wildfowl Trust in England initiated its own propagation effort. The Trust has been very successful with the nene, and has distributed breeding stock to many other zoos and aviaries, as well as to the FWS Patuxent Wildlife Research Center and the State of Hawai'i. Consequently, there is now an ample supply of nene in captivity.

In 1972, the National Park Service (NPS), in cooperation with the FWS and HDFG, began a nene restoration program at Hawai'i Volcanoes National Park. Predator-resistant, fenced enclosures have been constructed in current and former nene habitat, each holding a pair of wing-clipped adult birds that can live and breed under semi-natural conditions. Nene offspring are permitted to leave the pens to occupy the surrounding habitat. These areas have been improved through control of feral livestock, introduced predators, and exotic plants, and by reintroducing native plants. By November 1978, nine enclosures had been set up in locations ranging in elevation from sea level to 4,000 feet. Although gosling mortality has been high, it is thought that at least 30 nene have survived to adulthood in the park.

A similar, though less intensive program has been attempted at Haleakala National Park on Maui. Three nene enclosures have been constructed at the park headquarters to maintain three breeding pairs. During the 1973-1974 breeding season, four goslings were raised by two pairs; however, only one gosling was raised from 17 eggs laid during the 1977-1978 season. The NPS nene activities on Maui supplemented the HDFG release program that began on that island in 1962. In that earlier effort, birds from the Severn Wildfowl Trust were released at Paliku, and others from the Pohakuloa breeding station on Hawai'i went to Paliku and Hosmer Grove. A total of 489 nene have been released on Maui.

Survival and dispersal of released nene are the main subjects of a field study being conducted as part of the restoration effort. Data on nesting, predation, movements, and other aspects of nene ecology also are being collected. An analysis of data gathered since 1975 indicates that the nene population on Hawai'i has actually declined, and that the same thing has happened on Maui. NPS research points to very low productivity of the nene in the wild. Almost half the adult nene under observation during 1978-1981 failed to breed each year. The low breeding effort and high gosling mortality may be linked with a lack of adequate food during the critical breeding/molting period.

Predation could be another significant factor in the low productivity. Young nene cannot fly until 11-14 weeks after hatching, and adults are flightless for 4-6 weeks during their molt. At these times, the birds are extremely vulnerable to predation by dogs, cats, feral pigs, and mongoose. Studies at Hawai'i Volcanoes National Park implicate mongoose in 72 percent of the eggs and brooding females lost from nests under observation.

Recovery

The primary objective of the Nene Recovery Plan is to establish populations of 2,000 nene on Hawai'i and 250 on Maui, well distributed on secure habitat and maintained exclusively by natural reproduction. Minimizing nene mortality in the wild and further supplementing the wild population with periodic releases of captive propagated birds so that the populations can become self-sustaining have high priority in the plan. Mortality is particularly important since the nene has such low productivity compared with other species of geese. Losses of nests and broods could be reduced by restricting access to nene nesting areas during the critical breeding season through agreements with private landowners and public land managing agencies. Predator control programs in these areas would give the nene an even better opportunity to increase.

Conservation of key habitat for the nene, especially feeding and nesting areas, is essential if the wild population is to recover. Approximately 25 percent of this habitat is managed by government agencies and is relatively secure, but the remainder is in private ownership and is subject to adverse development. Cooperative agreements or conservation easements with landowners could give more consideration to the needs of the nene in management of these areas.

The plan also calls for establishing additional breeding populations on Hawai'i, and recommends that further reintroductions at lower elevations be considered. This would help in assessing the significance of nutrition in the nene's low productivity since some lower areas may have better quantities and quality of food; it would also minimize threats to the species' survival from losses of upland populations. The habitat currently occupied by the nene is apparently the best remaining, but is not necessarily the optimum or preferred habitat.

A monitoring program is incorporated in the plan to detect population trends and to evaluate the success of the recovery effort. Part of this program may consist of a complete life history study on the nene to better understand the effects of nutrition, competition with introduced turkeys (*Mealeagris gallopavo*), impacts on the habitat from exotic ungulates, and losses of goslings from disturbance during adverse weather conditions.

Giant Anole

The Culebra Island "Giant" anole (*Anolis roosevelti*) is known from only two preserved specimens, both taken from Culebra Island, Puerto Rico, and has not been collected since 1932. For these reasons some authors have expressed the opinion that the species is extinct; however, there is reason to believe the species survives in remaining forest on Culebra Island.

Accordingly, the Service approved the Culebra Island "Giant" Anole Recovery Plan on January 28, 1983. The plan calls for surveys to confirm the existence of the species, and for efforts to protect the few remaining patches of fig forest on Culebra until such time that it can be assured the species is extinct or until it is rediscovered and its precise habitat requirements are determined.

A. roosevelti, a rather large brownish-gray lizard growing to about 160mm snout-vent length, was first described by Major Chapman Grant in 1931 on the basis of one specimen collected by a local child on Culebra. In 1932, Major Grant received and reported on another specimen of this species also collected by a local resident of the island. This was the last specimen of the species to be seen by biologists.

Recent workers have located Mr. Dumas, the person who collected the lizard for Major Grant in 1931, who not only remembers the habits of the lizard but claims to have seen one as recently as 1978. Mr. Dumas described the lizard as living high in the trees where it was occasionally seen in the branches, and he claimed that he saw it most commonly when the fruits of the trees, especia ly the *Ficus,* are ripe. Mr. Dumas relates that the first specimen of *A. roosevelti* was collected on the Flamenco Peninsula before it was deforested. That area once supported a forest of tall gumbo-limbo (*Bursera*) and *Ficus* trees, much like the small patches that remain on steep northern slopes of the island.

A. roosevelti is listed as Endangered under the Endangered Species Act of 1973, and Critical Habitat has been determined on Culebra Island to include most of the remaining forest habitat. These remaining patches of virgin forest should be large enough to maintain a few lizards; however, several parties of herpetologists have made specific searches for the species in the last few years without success.

According to the newly approved recovery plan for the anole, the species will be considered "recovered" only when, among other things, field studies have determined that the species is still extant in the wild, and that the biotic and abiotic factors essential for the species' continued survival are known. In addition, the plan calls for programs to monitor the stability of the lizards' population size and habitat.

Copies of this recovery plan are available from the Fish and Wildlife Reference Service. For more information regarding the Culebra Island "Giant" Anole Recovery Plan, contact the Atlanta Regional Director (see page 2 for address).

More California Condor Chicks Hatched

Three more California condor (*Gymnogyps californianus*) chicks hatched during April/May, two at the San Diego Zoo and one in the wild. This brings the number of chicks known to have been produced this spring (as of June 1) to five. Four of these chicks hatched from eggs collected under permit for captive breeding in the future.

Two condors had hatched earlier this season (see the April 1983 BULLETIN), and the third chick at the San Diego Zoo emerged from its egg on May 25. Earlier, the sporadic incubation that the egg received from its natural parents before it was taken to the zoo was thought to have damaged its chances of hatching. A fourth chick hatched at the zoo 2 days later from an egg laid on March 30 and collected on April 26. All four chicks are responding well to the care they are receiving from the zookeepers. A chick was hatched this spring in the wild as well, and is being raised by its natural parents. Further, another condor pair is incubating its third egg of the season in the first confirmed case of "triple clutching" by California condors. (The pair's first egg was one of those hatched at the San Diego Zoo, and its second egg became broken during incubation by the adult birds.)

One troubled California condor breeding pair lost two eggs last year during squabbles over incubation rights, and similar problems this spring led to the collection of its second egg for safe keeping and hatching at the San Diego Zoo. In an effort to gain some insight into the birds' puzzling behavior and to see if California condors will accept a chick placed into a nest, an Andean condor (*Vultur gryphus*) chick from the Patuxent Wildlife Research Center (PWRC) flock was substituted for the dummy egg that had been put in the pair's nest earlier. (An Andean surrogate was chosen for the experiment since 1) these birds are not as rare as the California condor, 2) PWRC work has shown that Andean condor pairs will accept artificially incubated eggs, and 3) they are already being produced in captivity.) One day later, however, the Andean chick was nudged out of the nest during examination by an adult condor and rolled over a ledge. It was quickly taken to the San Diego Zoo where it seems to have recovered well.

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peregrinus) are nesting this year on two bridges in New York City. The pairs are known to be raising five young. An interesting aspect is that one of the two adult female peregrines was hatched in an eyrie in central New Hampshire in 1981. A third pair appears to be nesting under the Bay Bridge near Annapolis, Maryland.

Canadian bald eagle (*Haliaeetus leucocephalus*) work is proceeding well, thanks to the excellent cooperation of our Canadian counterparts. Surveys to identify potential donor nests are complete in Manitoba, Saskatchewan, and Nova Scotia. All three provinces are willing to provide some birds to States on this side of the border.

On April 7, Regional Botanist Richard Dyer received the prestigious "Outstanding Achievement in Conservation" award at the 61st annual meeting of the New England Wildflower Society. Dyer was cited for his contributions to the Society's goals of education and conservation. Specifically highlighted were his roles in protecting Maine's St. John River watershed and developing the regional publication *New England's Rare, Threatened, and Endangered Plants.*

Region 6—Chris Servheen, the Service's Grizzly Bear Coordinator, chaired a workshop for developing a trend monitoring system for grizzly bear (*Ursus arctos horribilis*) research. Development of a trend monitoring system is a number one priority task in the Grizzly Bear Recovery Plan. It is very important that agencies be able to determine the trend of grizzly populations so that they can monitor the effects of their management actions on these populations. Five types of trend monitoring systems identified at a similar workshop in 1982 have been field tested to some extent. The results of these studies were discussed, and plans were made for future work.

The Interagency Grizzly Bear Steering Committee met in November of last year. One action was the appointment of a subcommittee to reexamine population data for grizzlies in the Yellowstone Ecosystem. The subcommittee met in January, and in February it presented its findings to the full committee in Salt Lake City, Utah. It was concluded that although there had been a significant decline in numbers of female grizzly bears with cubs since 1959, no detectable trend was evident from 1974 to 1982. It was calculated that, as of 1980, there was a minimum of 183 to 207 grizzly bears in the ecosystem. This count was an estimate based upon documented sightings of female grizzlies with cubs.

The Montana Bald Eagle Working Group met in April. The main item of

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discussion was the management guidelines that are being developed.

Region 7—Peregrine falcon field activities planned for the summer of 1983 include nesting surveys and nestling banding on the Tanana, Yukon, Porcupine, and Colville Rivers. This marks the fifth year the Service has conducted surveys and banding efforts in peregrine concentration areas in Alaska. If peregrine productivity continues to increase as it has in the recent past, Service biologists and contractors may band over 200 nestlings this summer.

Several Aleutian Canada goose (*Branta canadensis leucopareia*) research and recovery activities are scheduled for this field season. Research efforts are being directed toward clarifying the taxonomic status of geese nesting along the Alaska Peninsula (Semidi Islands) and the eastern Aleutian Islands. The removal of introduced Arctic foxes (*Alopex lagopus*) from Amukta and Kiska Islands will be initiated this summer. When fox removal efforts are completed, more island habitat will be available for nesting by Aleutian geese and a multitude of other native marine and land birds. Lastly, in the continuing effort to reestablish former breeding populations, as many as 200 adults and goslings will be trapped on Buldir and released on Agattu Island in August. The Service has chartered the marine vessel *Western Pacific* for logistical support in the Aleutians this summer.

BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES HAVING PLANS
Mammals	15	18	223	3	0	22	281	18
Birds	52	14	144	3	0	0	213	33
Reptiles	8	6	55	8	4	0	81	6
Amphibians	5	0	8	3	0	0	16	2
Fishes	29	4	11	12	0	0	56	20
Snails	3	0	1	5	0	0	9	5
Clams	23	0	2	0	0	0	25	0
Crustaceans	2	0	0	1	0	0	3	1
Insects	7	0	0	4	2	0	13	3
Plants	55	2	0	9	1	2	69	7
TOTAL	199	44	444	48	7	24	766	95**

*Separate populations of a species, listed both as Endangered and Threatened, are tallied twice. Species which are thus accounted for are the gray wolf, bald eagle, American alligator, green sea turtle, and Olive ridley sea turtle.

**More than one species may be covered by some plans.

Number of species currently proposed for listing: 36 animals
8 plants

Number of Critical Habitats determined: 55
Number of Recovery Teams appointed: 69
Number of Recovery Plans approved: 89
Number of Cooperative Agreements signed with States: 38 fish & wildlife
11 plants

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Prairie Dog

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diately halt any taking if it receives substantial information that the survival of the populations in the effected areas is being jeopardized.

Effects of a Final Rule

If the proposal is approved as proposed, the status of the Utah prairie dog will be reclassified under the Endangered Species Act from Endangered to Threatened, and the special rule authorizing a limited control program would go into effect as authorized in 50 CFR 17.31. The species would continue to receive protection as a Threatened species, including the habitat conservation measures in Section 7 of the Act. Permits for certain activities affecting Threatened species could be authorized under the provisions of 50 CFR 17.32.

Public Comment Requested

Comments on the proposal or possible alternatives are requested until July 12, 1983, from all interested agencies, organizations, or individuals, and should be addressed to the Denver Regional Director, P.O. Box 25486, Denver Federal Center, Denver, Colorado 80225. Requests for public hearings must be received in writing by June 27, 1983.

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